UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,104	11/10/2006	Russell Chipman	256685US20PCT	3033

22850   7590   12/12/2008
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EXAMINER
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ART UNIT	PAPER NUMBER
2877	

NOTIFICATION DATE	DELIVERY MODE
12/12/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 August 2008</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-17</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-17</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>10 November 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>02/03/2006</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, see Remarks on pages 7-10, filed on August 29, 2008,

with respect to the rejection(s) of claim(s) 1-16 under 112, 2nd paragraph and 103 (a)

rejections have been fully considered and are persuasive. Therefore, the rejection has

been withdrawn. However, upon further consideration, a new ground(s) of rejection is

made in view of **Garcia et al**.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims **1-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Zhou et al. (7,287,855) in view of **Garcia et al** (6,927,888). ('**Zhou**' and '**Garcia**')

        As to claim 1, Zhou discloses positioning and focusing polarimeter **58** onto the

object (Column 9, lines 60-65 and Fig. 4); illuminating the object **20** with a series of at

least 16 polarization states (Column 11, lines 27-35 and Fig. 4); analyzing a plurality of

reflected images corresponding to said at least 16 polarization states (Column 4, lines

17-20); and obtaining a Mueller matrix for each image of the plurality of reflected

images.

Zhou *fails to disclose* calculating a depolarization parameter from the Mueller matrix.

However, **Garcia** teaches calculating a depolarization parameter from the Mueller matrix (Column 15, lines 39-48).

It would have been obvious to one skilled in the art at the time of the invention to include the method of calculation of **Garcia** in the identifying method of **Zhou** in order to determine various imperfections within the object under test so that classifying and identification procedures can be carried out.

As to claim 2, Zhou in view of **Garcia** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses at least one of an average degree of polarization and a weighted average degree of polarization of reflected images (Column 2, lines 49-51).

As to claim 3, Zhou in view of **Garcia** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses at least one of a degree of polarization surface and a degree of polarization map of the reflected images (Column 2, lines 49-51).

As to claim 4, Zhou in view of **Garcia** discloses all of the claimed limitations as applied to Claim 3 above **in addition Zhou** discloses calculating at least one of a minimum and a maximum degrees of polarization of the reflected images (Column 11, lines 62-67).

As to claim 5, Zhou in view of Garcia discloses all of the claimed limitations as applied to Claim 4 above in addition Zhou discloses wherein said step of calculating at least one of a minimum and a maximum degrees of polarization comprises calculating both a minimum and a maximum degrees of polarization (Column 11, lines 62-67); and calculating a difference between said minimum and a maximum degrees of polarization (Column 12, lines 1-5).

As to claim 6, Zhou in view of Garcia discloses all of the claimed limitations as applied to Claim 1 above in addition Zhou discloses decomposing said Mueller matrix into a depolarization matrix and at least one of a diattenuation matrix and a retardance matrix (Column 2, lines 43-51).

As to claim 7, Zhou in view of discloses all of the claimed limitations as applied to Claim 6 above in addition Zhou discloses calculating a depolarization relative to a corresponding diattenuation or retardance axis (Column 2, lines 43-51).

As to claim 8, Zhou in view of Garcia discloses all of the claimed limitations as applied to Claim 6 above in addition Zhou discloses a depolarization relative to a corresponding diattenuation or retardance off-axis (Column 2, lines 43-51).

As to claim 9, Zhou in view of Garcia discloses all of the claimed limitations as applied to Claim 8 above in addition Zhou discloses wherein said off-axis is 45.degree (Column 10, lines 28-34 and Fig. 6).

As to claim 10, Zhou in view of Garcia discloses all of the claimed limitations as applied to Claim 1 above in addition Zhou discloses calculating a ratio of diattenuation to polarizance (Column 2, lines 43-51).

As to claim 11, Zhou in view of Garcia discloses all of the claimed limitations as applied to Claim 1 above in addition Zhou discloses calculating a ratio of an average magnitude of Mueller matrix rows to an average magnitude of Mueller matrix columns (Column 16, lines 31-36 and Fig. 9).

As to claim 12, Zhou in view of Garcia discloses all of the claimed limitations as applied to Claim 1 above in addition Zhou discloses at least one of an optical polarimeter 58, an X-ray polarimeter, an IR polarimeter, or a UV polarimeter (Column 16, lines 13-17 and Fig. 9).

As to claim 13, Zhou in view of Garcia discloses reflecting light 92 from the retina to a co-polarized photodetector 104/106 via the objective lens 96 (Column 10, lines 1-11 and Fig. 4), the rotating half-wave retarder 78, the non-polarizing beam splitter 66, a second liquid crystal polarization controller 80, and a polarizing beam splitter 98 (Column 9, lines 53-58).

Zhou *fails to disclose* emitting laser light to a retina via (a) a polarizer, (b) a first liquid crystal polarization controller, (c) a non-polarizing beam splitter, (d) a rotating half-wave retarder, and (e) an objective lens, the laser light passing through (a), (b) and (c) in this order.

However, **Garcia** teaches emitting laser light to a retina via (a) a polarizer **P1**, (b) a first liquid crystal polarization controller, (c) a non-polarizing beam splitter, (d) a rotating half-wave retarder, and (e) an objective lens, the laser light passing through (a), (b) and (c) in this order (Column 10, lines 45-55 and Fig. 1).

It would have been obvious to one skilled in the art at the time of the invention to include the emitting methods of **Garcia** in the polarimetry method of **Zhou** in order to allow controlled transmittance of the beam within the system for comparison purposes of the different intensities to the object under test.

As to claim 14, **Zhou** in view of **Garcia** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses passing light **92** from said polarizing beam splitter **98** to a cross-polarized photodetector **104/106** (Column 10, lines 1-5 and Fig. 4).

As to claim 15, Zhou in view of **Garcia** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses adjusting a light parameter by controlling the retardance of said first and second liquid crystal polarization controllers **78** and **80** by changing a respective retardance over more than one wave of retardation (Column 13, lines 36-43).

And as to claim 16, Zhou in view of **Garcia** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses acquiring four sets of images (Column 15, lines 61-66), wherein a first set of images corresponds to the two liquid crystal polarization controllers being adjusted to +7/8 and +7/8 waves retardance,

a second set of images corresponds to the two liquid crystal polarization controllers

being adjusted to +7/8 and + 9/8 waves retardance, a third set of images corresponds to

the two liquid crystal polarization controllers being adjusted to + 9/8 and + 9/8 waves,

and a fourth set of images corresponds to the two liquid crystal polarization controllers

being adjusted to + 9/8 and +7/8 waves.

Zhou *fails to disclose* the adjustment of the positions of the liquid crystal

polarization controllers.

However, **Garcia** teaches the adjustment of the positions of the liquid crystal

polarization controllers (Column10, lines 45-55 and Fig. 1).

It would have been obvious to one skilled in the art at the time of the invention to

include the adjustment method of **Garcia** in the polarimetry method of **Zhou** in order to

vary the retardance of the illuminated beam, to obtain different wave values for

calibration of the system.

4.   Claim **17** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Zhou et**

al. (7,287,855) in view of **Garcia et al.** (6,927,888), as applied to claim 15 above, and

further in view of **Easley et at**. (5,603,710). ('**Zhou**', '**Garcia**' and '**Easley**')

As to claim 17, Zhou in view of **Garcia** discloses producing a depolarization

parameter and one of a retardance and a diattenuation parameter (Column 2, lines 43-

51); collecting light reflected off the retina with a receiver **104/106** located outside of the

eye **20** or inside of the eye **20** (Column 10, lines 1-5 and Fig. 4); analyzing the reflected

light with a polarization state analyzer (Column 4, lines 17-20); obtaining a Mueller

matrix image from the reflected light; and analyzing said Mueller matrix to obtain a

depolarization parameter (Column 15, lines 39-48; **Garcia**).

Zhou in view of **Garcia** *fails to disclose* illuminating a retina with polarized light

via a probe inserted into the eye.

However, **Easley** teaches illuminating a retina with polarized light via a probe **25**

inserted into the eye (Column 2, lines 46-51 and Fig. 3).

It would have been obvious to one skilled in the art at the time of the invention to

include the probe of **Easley** in the polarimetry method of **Zhou** in view of **Garcia** in

order to safely illuminate specific areas of the object under test with minimal disturbance

to other areas.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to IYABO S. ALLI whose telephone number is (571) 270-

1331. The examiner can normally be reached on M-Fr: 7:30am- 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Gregory Toatley can be reached on 571-272-2059. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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assistance from a USPTO Customer Service Representative or access to the

automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-

1000.

IYABO S. ALLI
Examiner
Art Unit 2877
November 25, 2008 /I. S. A./
Examiner, Art Unit 2877

/L. G. Lauchman/
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